CHAPTER III

RESEARCH METHODOLOGY

III.1. Research Design

The design of this research was comparative quasi-experimental study focusing on quantitative research which aimed to compare the effect of Visual Imagery Strategy and SMART Strategy on students' reading comprehension. According to Gay and Airasian (2000:367). Experimental Research is the type of research that tests hypotheses to establish cause and effect relationships.

There were three variables in this research; Visual Imagery Strategy (X1) and Self-Monitor Approach to Reading and Think (SMART) Strategy (X2) were independent variables, while the students' reading comprehension was a dependent variable. L. R Gay (2000: 364) states that the comparative quasi-experimental design involves selecting two groups differing in some independent variables and comparing them with some dependent variables. It compares the effect of two or more treatments and also randomly assigns subjects to the different treatments.

In this research, Visual Imagery Strategy was used in the experimental group 1. Then, the experimental group 2 used SMART Strategy. For both groups, a pre-test and post-test and were administered to the students. The pre-test were given before the treatment in order to identify

students' motivation and reading comprehension. Then, the post-test was given after the treatment.

In addition, McGowen (2011:1) states that a comparative experiment plays a role in each phase of an educational program, from studies of initial efficacy in larger trials that confirm or optimize the effects of educational interventions. McGowen (2001:368) also points out three types of comparative quasi-experimental study;

1. A versus B: Comparison of two different approaches
2. A versus no A: Comparison of a new approach and the existing approach
3. A Little of A versus a lot of A: The comparison of different amount of a single approach.

Based on the explanation above, this research was focused on type 1 (comparison of two different approaches). Gay (2000:364) states that the major difference between an experimental research and a causal-comparative research is that in the experimental research the independent variable the alleged cause, is manipulated, and in causal-comparative research it is not because it has already occurred.

In the experimental research, the researcher can randomly form groups and manipulate independent variable, while in causal-comparative research, the groups are already formed and already divided into the independent variable. Furthermore, causal-comparative studies identify

relationships that may lead to experimental studies, but only relationship is established. On the other hand, cause-effect relationships established through causal comparative research are at best tenuous and tentative. Only experimental research can truly establish cause-effect relationship. So, to investigate the students' reading comprehension a post test was administered as displayed in the following table:

Table III.1

Research Design

Group	Pre-test	Treatment	Post test
EG 1	**O1**	**X1**	**O2**
EG 2 (C)	**O1**	**X2**	**O2**

Figure: Creswell (2009:160)

EG 1 : Experimental Group 1

EG 2 : Experimental Group 2 (Unstated Control Group)

O1 : Pre - test

O2 : Post - test

X1 : Dependent variable 1 (Visual Imagery Strategy)

X2 : Dependent variable 2 (SMART Strategy)

Based on the above diagram, Creswell (2009: 160) argues that in a quasi-experimental design, the experimental group A and the experimental

group B (control group) are selected without random assignment. The independent variable differentiating the groups must be clearly and operationally defined, since each group represents a different population. The way in which the groups are defined will affect the generalizability of the results.

In addition, Gay (2000:392) states that this design requires at least two groups, each of which is formed by random assignment. Both groups are administered a pre-test and each group receives a different treatment. Both groups are post-tested at the end of the study. The post-test scores are compared to determine the effectiveness of the treatments. The pre-test-post-test control group design may also be expanded to include any number of treatment groups.

III.2. The Location and the Time of the Research

This research was conducted at SMK Keuangan Pekanbaru located on Jl. Tuanku Tambusai, Pekanbaru from November to December 2016.

III.3 The Population and Sample of the Research

1. Population

The population of this research was the second year students of SMK Keuangan Pekanbaru in the academic year 2016-2017 which

consisted of 5 classes. Two classes with the same capability were chosen by using cluster sampling.

Table III.2

Population of the Second Year Students of SMK Keuangan Pekanbaru

Class	Total of Students
XI/a	31
XI/b	32
XI/c	33
XI/d	35
XI/e	32
Total Population	163

2 Sample

Cluster sampling technique was used to determine the sample of the research which means that one group or class was specified to be the sample respondents to this research. Gay (2000:129) states cluster sampling randomly selects groups, not individual. All the members of selected groups had similar characteristics. The total number of the population of the second year students at SMK Keuangan Pekanbaru in academic year 2016/2017 was 163 students. Of the 5 classes of the

second year, two classes were taken as the sample of this research that can be seen from the table below:

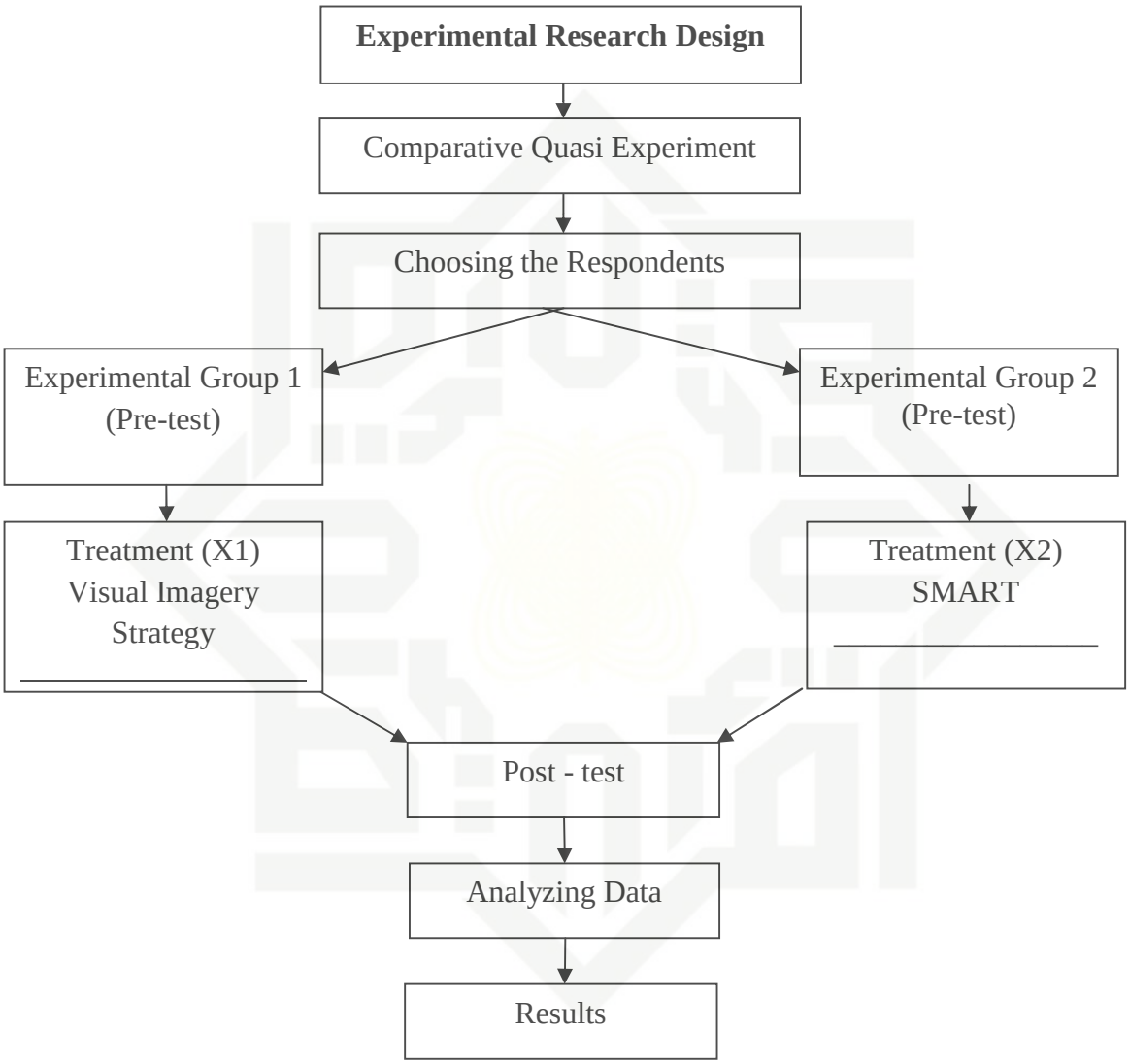
Table III.3. Sample of the Research

No	Sample	Male	Female	Total
1	XI/a	14	17	31
2	XI/b	16	16	32
	Total	30	33	63

In this research, the number of the samples was 63 students each of which Perbankan A (XI/a) was treated as the experimental group 1, and Perbankan B (XI/b) was treated as the experimental group 2.

III.4 Research Procedure

Figure III.1 Research Design



III.5 Research Instruments

To collect the data, 25 reading tests were administered as the instrument of this study. The pre-test and post- test were administered to two classes; XI/a as experimental group 1 and XI/b. as experimental group 2.

The pre-test was administered before the treatment and the post-test was administered after the treatment, aiming at finding out the students' reading comprehension after treatment. After the treatments, the Visual Imagery Strategy was applied in the experimental group 1 and the SMART Strategy in the experimental group 2. These activities were also intended to find out whether the students' skill kept the material in mind after doing the treatment.

III.6 Data Collection Technique

In order to get the data to support this study, the data collection technique used are as follows:

1. **Observation**

   Observation was used to observe directly the students during the teaching and learning process. In observation technique, the researcher had a list of observational items to be observed in the class by using Visual Imagery Strategy and SMART Strategy.

Table III.4

The Observation List of Visual Imagery Strategy (X1)

No.	Indicators	Observation Checklist	
		Yes	No
1.	The teacher introduces Visual Imagery Strategy to the students.		
2.	The teacher prepares the instruction of using Visual Imagery Strategy.		
3.	The teacher distributes a report text to the students and gives a brief explanation about report text.		
4.	The teacher asks the students to read the text individually.		
5.	The teacher asks the students to draw a visual image in their mind about what they have read in each paragraph individually.		
6.	The teacher asks the students to jot down the vocabulary or sentence(s) that they do not understand and cannot draw the		

	visual image in their mind.		
7.	The teacher asks the students to retell the text with their own words individually.		
8.	The teacher asks the students to go back to each unfamiliar vocabulary or sentence(s) and see whether they already can make sense of the text by drawing a visual image in their mind or not.		
9.	The teacher asks the students to form groups which consist of 3 or 4 students.		
10.	The teacher asks the students to discuss each unfamiliar vocabulary or sentence(s) that they do not understand yet.		
11.	The teacher asks the students to do a task related to the text given.		
12.	The teacher monitors the students and gives them assistance.		
13.	Finally, the teacher guides the students to take a conclusion of the lessons that		

	they have learned.		

Table III.5

The Observation List of SMART Strategy (X2)

No.	Indicators	Observation Checklist	
		Yes	No
1.	The teacher introduces SMART Strategy to the students.		
2.	The teacher prepares the instruction of using SMART Strategy.		
3.	The teacher distributes a report text to the students and gives a brief explanation about report text.		
4.	The teacher asks the students to read the text individually.		
5.	The teacher asks the students to place a check mark (√) next to each paragraph that they understand and place a question mark (?) next to each paragraph that they		

	do not understand individually.		
6.	The teacher asks the students to retell the text with their own words individually.		
7.	The teacher asks the students to go back to each question mark (?) and see whether they already can make sense of the question mark (?) paragraph by using SMART protocol or not. If the question mark (?) paragraph has been solved, the teacher asks them to change the question mark (?) into a checkmark (√).		
8.	The teacher asks students to form groups which consist of 3 or 4 students.		
9.	The teacher asks the students to discuss each question mark (?) paragraph that they do not understand yet.		
10.	The teacher asks the students to do a task related to the text given.		
11.	The teacher monitors the students and gives them assistance.		

12.	Finally, the teacher guides the students to take a conclusion of the lessons that they have learned.		

2. Test

To find out the effect of using Visual Imagery Strategy and SMART Strategy on students' reading comprehension at SMK Keuangan Pekanbaru, a test was administered to assess the students' reading comprehension, especially in report text. The test was divided into two stages; a pre-test and a post-test. The pre-test was conducted before the treatment and the post-test after the treatment. The students' reading comprehension was measured by the total scores from the results of the test. The classification of the students' scores is shown below.

Table III.6

The Classification of Students' Score

Score Range	Categories
81-100	Very Good
61-80	Good
41-60	Fairly Good
21-40	Poor

0-20	Very Poor

(Harris, 1986)

If the students were able to achieve the goal, it means that the assessment of students' reading comprehension needed to be correlated with the purposes of achievement.

In this research, the data were collected by distributing a pre-test and a post-test to the students. The test consisted of five passages where each of the passage consisted of five questions related to the passage and the aspects to be assessed of reading comprehension. The time allocation and procedures of Visual Imagery Strategy and SMART Strategy were determined before hand. The tests were taken from the students' textbook and internet materials.

III.7. Validity and Reliability Test

1. The Validity of Instrument

Before collecting the data, each item of question was tested in order to be ideal to be tried out. The purpose of the try out was to find out the quality of the test items. Brown (2000:22) states that a test is one way to measure a person's ability, knowledge, or performance in a given domain. Validity is the extent to which inferences make from assessment results are

appropriate, meaningful, and useful in terms of the purpose of the assessment.

The points of difficulty level and discrimination index were analyzed by using a formula (Heaton, 1975 : 178).

$$FV = \frac{R}{N} x100\%$$

Where;

FV : The index of difficulty

R : The number of correct answer

N : The number of respondents

Creswell (2008:169) states that validity is the individual's scores from an instrument make sense, meaningful, enable you, as the researcher, to draw good conclusions from the sample you are studying to the population. It means that validity is the extent to which inferences made from assessment results are appropriate, meaningful, and useful in terms of the purpose of the assessment.

To analyze the validity of data, the researcher analyzed them by inter item validity using SPSS 20 program. The following table is the criteria of items validity.

Table III.7

The Criteria of Items Validity

R	Interpretation
0,80 < r ≤1,00	Very High
0,60 < r ≤ 0,79	High
0,40 < r ≤ 0,59	Average
0,20 < r ≤ 0,39	Low
0,00 < r ≤ 0,19	Very Low

Table III.8

The Analysis of Try Out of Reading Comprehension Validity

Item	R	Interpretation of Validity	Status
1	0.70	High	Valid
2	0.80	Very high	Valid
3	0.95	Very high	Valid
4	0.70	High	Valid
5	1.00	Very high	Valid
6	0.75	High	Valid
7	0.95	Very high	Valid
8	0.30	Low	Invalid

9	0.80	Very high	Valid
10	0.85	Very high	Valid
11	1.00	Very high	Valid
12	0.90	Very high	Valid
13	1.00	Very high	Valid
14	0.75	High	Valid
15	0.30	Low	Invalid
16	0.70	High	Valid
17	0.85	Very high	Valid
18	0.75	High	Valid
19	0.90	Very high	Valid
20	0.80	Very high	Valid
21	0.25	Low	Invalid
22	1.00	Very high	Valid
23	0.90	Very high	Valid
24	0.90	Very high	Valid
25	0.75	High	Valid

Based on the tryout results of the test instrument validity of 25 items the table shows that 22 items are valid. It means that the instrument could be used in this research. The blueprint of the research instrument is presented below:

Table III.9

The Blueprint of Research Instrument

No.	Indicators	Number of Item(s)	Item
1.	**Finding Main Idea** *Reading is concerned with the meaning to a greater extend with form.*	5	1, 7, 11, 19, 23
2.	**Factual Information/Detail** *Factual information requires readers to scan specific details. There are many types of question of factual information such as; question type of reason, purpose, result, comparison, means, identification, time, and amount.*	5	4, 9, 14, 18, 22
3.	**Finding the meaning of Vocabulary in Context of the Text** *The readers could develop their guessing ability to the word which is unfamiliar with them by relating the close meaning or unfamiliar words to the text and the topic of the text that is read.*	5	2, 8, 12,17,25
4.	**Identifying Reference** *Recognizing reference words or phrases to which they refer will help readers understand the reading passage. Reference words are usually short and are frequently , nouns or pronouns, such it, she, he, this, those, and so*	5	3, 10, 13, 20, 24

	on.		
5.	**Making Inference** *The importance of reading is to understand what the writer has written; it is expected that reader can infer what the writer writes. In order words, a good reader is able to draw inference logically and make accurate prediction.*	5	5, 6, 15, 16, 21

King and Stanley (1989:30)

2. The Reliability of Instrument

Reliability is an important characteristic of a good test. In order to calculate the reliability of the test, the mean of the students' scores the standard deviation is sought. To find out the reliability of the test the following formula was used; the discrimination index of an item indicated the extent to which the item discriminated between the students, separating the more able students from the less able ones. The following formula was taken from Heaton (1975: 164) as follows:

$$r_{ii} = \frac{N}{N-1}\left(1 - \frac{m(N-m)}{N X^{2}}\right)$$

Where; $M = \frac{\sum x}{N}$ and $S^2 = \frac{\sum x^2 - \frac{(\sum x_i)^2}{N}}{N}$

r_{ii} : Reliability of the test

N : The number of items in the test

M : The mean score of all the tests

S^2 : The standard deviation of all the test scores

Brown, (2003) says that reliability has to do with accuracy of measurement. This kind of accuracy was reflected in obtaining similar results when the measurement was repeated on different occasions or with different instruments or by different persons. Brown revealed that the characteristic of reliability was sometimes termed consistency. The following table is the level of internal consistency of Cronbach Alpha.

Table III.10

A Commonly Accepted Rule of Thumb for Describing Internal Consistency by Using Cronbach Alpha

Cronbach Alpha	Internal Consistency
α ≥ .9	Excellent
.9 > α ≥ .8	Good
.8 > α ≥ .7	Acceptable
.7 > α ≥ .6	Questionable
.6 > α ≥ .5	Poor
.5 > α	Unacceptable

Furthermore, there are several formulas which can be used to measure the reliability of the research instrument, such as Split-Half formula, Spearmen-Brown formula, Flanagan formula, Rulon formula, Hoyt formula, Alpha formula, Kuder-Richardson 20 (K-R 20) formula and Kuder-Richardson 21 (K-R 21) formula (Arikunto, 2006: 223). Of these formulas, Slit-Half formula was used in this research by using SPSS and the results of reliability could be seen through Guttman Split-Half Coefficient in reliability statistics on the output of SPSS.

Table III.11

The Criteria Coefficient of Reliability

Coefisien Reliability	Criteria
$0,80 \leq r_{11} \leq 1,00$	Highest reliability
$0,60 \leq r_{11} \leq 0,79$	High reliability
$0,40 \leq r_{11} \leq 0,59$	Middle reliability
$0,20 \leq r_{11} \leq 0,39$	Low reliability
$0,00 \leq r_{11} \leq 0,19$	Lowest reliability

To obtain the reliability of the test given, SPSS 20 program was used to find out whether or not the test was reliable.

Table III. 12

Cronbach Alpha Table

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.798	.798	25

Table III.12 shows the value of Cronbach's Alpha which is 0.798. It means that the items are reliable in which the value of internal consistency is .8 > .798 ≥ .7; so the reliability of the test is **acceptable**.

From the results of calculation by using SPSS, it is apparent that the value of Cronbach's Alpha Based on Standardized Items (or $_{11}$) of the test is 0.798. So, **0.60 ≤ 0,798 ≥ 0.80**, it means that the instrument is in **high realibility**.

III.8. Data Analysis Technique

The scoring guide was chosen as the criteria of scoring representing the basic aspects of reading. The reading results were evaluated by considering five aspects and each aspect had a score or a level. The specifications of the aspects were topic, main idea, specific idea, textual reference and word meaning.

In analyzing the data, the researcher used the scores of the pre-test and the post-test of experimental and control groups. These scores were analyzed statistically using both descriptive and inferential statistics. In this research, the researcher used the following formulas:

1. Independent sample t-test

To find out whether there is a significant difference or there is no significant difference between two or more variables

Independent Sample t test is employed. Gay (2000) added that the t-test for independent sample is used to determine whether there is a probable significant difference between the means of two independent samples. Independent sample t-test is used to find out the results of the first and the fourth hypotheses. They are as follows:

1. To find out whether there was a significant difference of students' reading comprehension before being given the treatment by using Visual Imagery Strategy for the experimental group 1 and the SMART Strategy for the experimental group 2.
2. To find out whether there was a significant difference of students' reading comprehension after being given the treatment by using Visual Imagery Strategy for the experimental group 1 and the SMART Strategy for the experimental group 2.

To analyze the final-test scores of the experimental group and the control group, the following formula was used:

$$t = \frac{M_X - M_Y}{\frac{SD_X^{\,2}}{N_1 - 1} - \frac{SD_Y^{\,2}}{N_2 - 1}}$$

1.

2. Where;

t	=	The value of comparing two means
M_X	=	Mean of the scores of the pre-test
M_Y	=	Mean of the scores of the post-test
SD_X	=	Standard deviation of the experimental group
SD_Y	=	Standard deviation of the control group
N_1	=	Number of the sample in the pre-test
N_2	=	Number of the sample in the post-test
1	=	The constant number

The t-table had the function to see if there was a significant difference between the mean score of both experimental groups. The t-obtained value was consulted with the value of the t - table at the degree of freedom (df) = (N1+N2)-2 which is hypothesized:

Ha: to > t-table

Ho: to < t-table

Ha is accept if to > t-table or there is an effect after giving the treatment using Visual Imagery Strategy and SMART Strategy Strategy on students' reading comprehension.

Ho is accept if to < t-table or there is no effect after giving the treatment using Visual Imagery Strategy and SMART Strategy on students' reading comprehension.

Afterward, to find out the effect size of the T-test, the following formula was applied:

$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

$$\textit{eta squared} = \tilde{\eta}^2 \times 100\%$$

Where;

eta squared : Coefficient effect

$\tilde{\eta}^2$: Coefficient

3. Dependent or Paired Sample t-test

Dependent sample t-test is known also as Paired-Sample t-test. The researcher used this formula to obtain the result of the second and the third hypotheses that was to find out whether there was a significant effect of using Visual Imagery Strategy and SMART Strategy on students' reading comprehension at SMK Keuangan Pekanbaru. L.R. Gay (2000:488) states that t-test for non-independent samples is used to compare groups that are formed by some types of matching or to compare a single group's performance on a pre-test and post-test or on two different treatments. At this time, the research used a pre-test and post-test scores of the experimental class in order to find out the significant effect of using Visual Imagery Strategy and SMART Strategy on students' reading comprehension at SMK Keuangan Pekanbaru.

To obtain the data, SPSS 20 was used.

The formula of paired sample t-test:

$$t = \frac{D}{\frac{\Sigma D^2}{N_1 - 1} - \frac{\frac{\Sigma D}{N}^2}{N_2 - 1}}$$

D = Gain Score (D=X2-X1)

The t-table has the function to see if there is a significant difference between the mean of the score of both pre-test and post-test. The t-obtained value is consulted with the value of the t-table at the degree of freedom (DF) =N-1 which is statistically hypothesized:

Ha: to >t-table

Ho: to<t-table

Ha is accepted if to > t-table or there is a significant effect after giving the treatments (Visual Imagery Strategy and SMART Strategy) on students' reading comprehension at SMK Keuangan Pekanbaru.

Ho is accepted if to < t-table or there is a significant effect after being given the treatments (Visual Imagery Strategy and SMART Strategy) on students' reading comprehension at SMK Keuangan Pekanbaru.

Afterward, it would better to find the coefficient effect of t-test by employing the following formula:

$$r^2 = \frac{t^2}{t^2+n-1}$$

$kp=r^2 \times 100\%$

Where:

Kp = Coefficient effect

r^2 = Coefficient

To find out the percentage of significant effect between the pre-test and the post-test of the experimental class was by looking for the effect size or eta-squared as follows:

$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

$$\textit{eta squared} = \tilde{\eta}^2 \times 100\%$$

Where;

$\tilde{\eta}^2$= eta squared

t^2= *t-test result*

n = students number